

## THE EFFECT OF GROSS VEHICLE WEIGHT ON PLATOON SPEED AND SIZE CHARACTERISTICS ON TWO-LANE ROAD

M.R.Karim<sup>1</sup>, A.A.Saifizul<sup>2</sup>, R.Syahira<sup>3</sup> and H.Yamanaka<sup>4</sup>

<sup>1,2,3</sup>Center for Transportation Research, University of Malaya, Kuala Lumpur, Malaysia. <sup>4</sup>Department of Civil Engineering, University of Tokushima, Japan.

Correspondence: <sup>1</sup>rehan@um.edu.my

### ABSTRACT

This paper presents the results of a study that attempts to empirically explore the influence of Gross Vehicle Weight (GVW) of the platoon leader on platoon size and platoon speed characteristics on two-lane road. The aim of this study is to observe how the platoon leaders' vehicle dynamics capability affects the platoon size and platoon speed variation. A Weigh-in-Motion (WIM) based traffic data collection system was installed in a two-way rural road section to capture a set of platoon-based traffic data for a month, 24-hours a day. From a total of 173,778 vehicles passing the road section, 17,820 platoon data were detected and utilized in an analysis process. Collected data was grouped as according to their platoon leader weight, and then analyzed by two-way ANOVA to evaluate its relationship to platoon speed and size. Empirical analysis results show that there is a significant relationship between GVW of platoon leader and both platoon speed and platoon size. The findings suggest that platoon speed decreases and speed variation increases alongside the increasing of GVW of platoon leader. However, it is proven that the average size of platoons led by heavy vehicles is smaller than platoons led by passenger cars. The formation of platoon involving heavy vehicles indeed has a large impact on driving behavior of either psychological or physical action. Thus, in order to reduce the risk of dangerous overtaking manoeuvre, there is a high necessity for traffic flow of different opposing directions to be separated and an extra lane shall be designed for particularly overtaking activities at accident prone areas.

**Keywords:** Platoon, Heavy Vehicle, Vehicle Weight, Platoon Size, Platoon Speed.